

USSN: 09/787,657

- 2 -

5947-01-AWZ

**Amendments to the Claims:**

This listing of claims will replace all prior versions, and listings, of claims in the application:

1. (Currently amended) An isolated and purified DNA sequence ~~substantially similar~~ having at least 70% identity to the DNA sequence shown in SEQ ID NOS 3 [[or 4]], wherein said isolated and purified DNA sequence encodes a polypeptide that is a voltage activated calcium channel  $\alpha 2\delta$ -C subunit.
2. (Currently amended) An isolated and purified DNA sequence that hybridizes to the DNA sequence shown in SEQ ID NOS 3 [[or 4]] under high stringency hybridization conditions, wherein said isolated and purified DNA sequence encodes a polypeptide that is a voltage activated calcium channel  $\alpha 2\delta$ -C subunit, and wherein said high stringency hybridization conditions comprises hybridization on a filter support at 65 °C in 7% SDS and 0.125 M sodium phosphate, followed by washing in 1% SDS, 20 mM phosphate buffer and 1 mM EDTA at 65 °C for between about 30 minutes to 4 hours.
3. (Currently amended) An isolated and purified DNA sequence that consists essentially of the DNA sequence shown in SEQ ID NOS 3 [[or 4]].
4. (Currently amended) An isolated and purified DNA sequence that has at least a 70% identity to a polynucleotide encoding the polypeptide expressed by SEQ ID NOS ~~5 or 6~~ NO: 5, wherein said isolated and purified DNA sequence encodes a polypeptide that is a voltage activated calcium channel  $\alpha 2\delta$ -C subunit.
5. (Currently amended) An isolated and purified DNA sequence that is fully complementary to the DNA sequence shown in SEQ ID NOS 3 [[or 4]].
6. (Currently amended) A recombinant DNA molecule comprising the isolated and purified DNA sequence shown in SEQ ID NOS 3 [[or 4]], wherein said isolated and purified DNA sequence encodes a polypeptide that is a voltage activated calcium channel  $\alpha 2\delta$ -C subunit.
7. (Original) A recombinant host cell comprising a host cell transfected with the recombinant DNA molecule of claim 6.

USSN: 09/787,657

- 3 -

5947-01-AWZ

8. (Withdrawn) A substantially purified recombinant polypeptide, wherein the amino acid sequence of the substantially purified recombinant polypeptide is substantially similar to the amino acid sequence shown in SEQ ID NOS 5 or 6.
9. (Withdrawn) A substantially purified recombinant polypeptide of Claim 8, wherein the polypeptide has at least about 70% amino acid sequence similarity to the amino acid sequence shown in SEQ ID NOS 5 or 6.
10. (Withdrawn) A substantially purified recombinant polypeptide, wherein the amino acid sequence of the substantially purified recombinant polypeptide consists essentially of the amino acid sequence shown in SEQ ID NOS 5 or 6.
11. (Withdrawn) An antibody that selectively binds polypeptides with an amino acid sequence substantially similar to the amino acid sequence of Claim 8.
12. (Withdrawn) A method of detecting  $\alpha 28$ -C or  $\alpha 28$ -D protein in cells, comprising contacting cells with the antibody of Claim 11 and incubating the cells in a manner that allows for detection of the  $\alpha 28$ -C or  $\alpha 28$ -D protein-antibody complex.
13. (Withdrawn) A diagnostic assay for detecting cells containing  $\alpha 28$ -C or  $\alpha 28$ -D mutations, comprising isolating total genomic DNA from the cell and subjecting the genomic DNA to PCR amplification using primers derived from the isolated and purified DNA sequence of Claim 1, 2, or 3 or by analyzing the genomic DNA directly by a hybridization method and determining whether the resulting PCR product contains a mutation.
14. (Withdrawn) A diagnostic assay for detecting cells containing  $\alpha 28$ -C or  $\alpha 28$ -D mutations, comprising isolating total cell RNA, subjecting the RNA to reverse transcription-PCR amplification using primers derived from the isolated and purified DNA sequence of Claim 1, 2, or 3 and determining whether the resulting PCR product contains a mutation.
15. (Currently amended) A method for the amplification of a region of the DNA sequence of Claim 1, 2, or 3, said region being desired to be amplified, the method comprising the step of: contacting a test sample suspected of containing the desired sequence of Claim 1, 2, or 3 or portion thereof with amplification reaction reagents, wherein said amplification reaction reagents comprise a pair of amplification primers and

USSN: 09/787,657

- 4 -

5947-01-AWZ

wherein said amplification primers each comprise at least 8 consecutive nucleotides of a polynucleotide of SEQ ID NO: 3.

16. (Original) A diagnostic kit for detecting the presence of at least one copy of the DNA sequence of Claim 1, 2, or 3 in a test sample, said kits containing a primer, a pair of primers or a probe, and optionally amplification reagents.

17. (Withdrawn) An assay for the detection or screening of therapeutic compounds that interfere with or mimic the interaction between the polypeptide of Claim 8, 9, or 10 and ligands that bind to the polypeptide of Claim 8, 9, or 10.

18. (Withdrawn) The assay of Claim 17, herein the assay comprises the steps of:  
providing a polypeptide of Claim 8, 9, or 10;

obtaining a candidate substance;

bringing into contact said polypeptide with said candidate substance; and

detecting the complexes formed between said polypeptide and said candidate substance.

19. (Withdrawn) A method for protecting mammalian cells from abnormal calcium flux, comprising introducing into mammalian cells an expression vector comprising the isolated and purified DNA sequence of Claim 1, 2, or 3, which is operatively linked to a DNA sequence that promotes the high level expression of the isolated and purified DNA sequence in mammalian cells.

20. (Withdrawn) A method for treating or preventing epilepsy, comprising introducing into a mammal an expression vector comprising the isolated and purified DNA sequence of Claim 1, 2, or 3, which is operatively linked to a DNA sequence that promotes the high level expression of the antisense strand of the isolated and purified DNA sequence in mammalian cells.

21. (Original) A method for purifying  $\alpha 2\delta$ -C or  $\alpha 2\delta$ -D protein from cells, comprising:

a) transfecting a host cell with a vector comprising the isolated and purified DNA sequence of Claim 1, 2, or 3 operatively linked to a promoter capable of directing gene expression in a host cell;

b) inducing expression of the isolated and purified DNA sequence in the cells;

c) lysing the cells;

USSN: 09/787,657

- 5 -

5947-01-AWZ

d) isolating  $\alpha 2\delta$ -C or  $\alpha 2\delta$ -D protein from the cells ; and  
purifying  $\alpha 2\delta$ -C or  $\alpha 2\delta$ -D protein from the isolate.

22. (Withdrawn) An isolated and purified DNA sequence substantially similar to the DNA sequence shown in SEQ ID NOS 11, 14-16, 21-24, 31-35, 40-41, 43-44, 47-48 or 49.

23. (Withdrawn) An isolated and purified DNA sequence that hybridizes to the DNA sequence shown in SEQ ID NOS 11, 14-16, 21-24, 31-35, 40-41, 43-44, 47-48 or 49 under high stringency hybridization conditions.

24. (Withdrawn) An isolated and purified DNA sequence that consists essentially of the DNA sequence shown in SEQ ID NOS 11, 14-16, 21-24, 31-35, 40-41, 43-44, 47-48 or 49.

25. (Withdrawn) An isolated and purified DNA sequence that has at least a 70% identity to a polynucleotide encoding the polypeptide expressed by SEQ ID NOS 11, 14-16, 21-24, 31-35, 40-41, 43-44, 47-48 or 49.

26. (Withdrawn) An isolated and purified DNA sequence that is fully complementary to the DNA sequence shown in SEQ ID NOS 11, 14-16, 21-24, 31-35, 40-41, 43-44, 47-48 or 49.

27. (Withdrawn) A substantially purified recombinant polypeptide, wherein the amino acid sequence of the substantially purified recombinant polypeptide is substantially similar to the amino acid sequence shown in SEQ ID NOS 17 or 42.

28. (Withdrawn) A substantially purified recombinant polypeptide of Claim 26, wherein the polypeptide has at least about 70% amino acid sequence similarity to the amino acid sequence shown in SEQ ID NOS 17 or 42.

29. (Withdrawn) A substantially purified recombinant polypeptide, wherein the amino acid sequence of the substantially purified recombinant polypeptide consists essentially of the amino acid sequence shown in SEQ ID NOS 17 or 42.

30. (Withdrawn) An antibody that selectively binds polypeptides with an amino acid sequence substantially similar to the amino acid sequence of Claim 26.

31. (Withdrawn) A method of using polynucleotide sequences to treat diseases which may result from alterations of  $\alpha 2\delta$ -C and/or  $\alpha 2\delta$ -D genes or from alterations of cellular pathways involving  $\alpha 2\delta$ -C and/or  $\alpha 2\delta$ -D, wherein the polynucleotide sequences are

USSN: 09/787,657

- 6 -

5947-01-AWZ

selected from the group consisting essentially of: M76559.1, AF040709.1, AF042792.1, AF042793.1, AB011130.1, T80372.1, AA360556.1, AI563965.1, N53512.1, AA000341.1, CAA90091.1, AI027237.1, AI026646.1, AA994701.1, AA887514.1, AI275868.1, AI675521.1, AA906993.1, AA301068.1, AI884536.1, AI862563.1, AI191453.1, AI241832.1, AA534927.1, AA329137.1, AI586961.1, AA394008.1, AW007700.1, R38827.1, AA255807.1, H11152.1, R60736.1, T16903.1, AA435601.1, AI094263.1, AA008996.1, AI105056.1, AI502878.1, Z84493.1, Z84494.1, Z75743.1, Z75742.1, Z84492.1, AA815447.1, AA190607.1, AI223142.1, AA188635.1, R43629.1, R20288.1, AA459684.1, AA662058.1, Z44942.1, Z40693.1, AI051759.1, AU022914.1, AI843362.1, G36524.1, AA459804.1, AI696320.1, AI051759.1, AI696214.1, AC010180.1, AA445859.1, AJ010949.1, AA190607.1, AI051759.1, T70594.1, T96901.1, AA766033.1, AI160471.1, AA719773.1, AI00360.1, AA442451.1, AA521470.1, AA770076.1, AA001411.1, AA001473.1, W22650.1, H86016.1, AC005342.1, AC005343.1, T96900.1, AI457823.1, AI377638.1, and AI433691.1, AA001473.1 and any of the polynucleotide sequences of SEQ ID NOS 1-16, 18-41, or 43-49.

32. (Withdrawn) The method of claim 31 wherein the disease is selected from the group consisting essentially of: seizure-related syndromes, migraine, ataxia, vestibular defects, chronic pain, mood, sleep interference, anxiety, ALS, multiple sclerosis, mania, tremor, parkinsonism, substance abuse/addiction syndromes, mood, depression, and cancer.

33. (Withdrawn) A method of using polynucleotide sequences to test for presence of a disease, or susceptibility to a disease, due to alterations or deletions in c28-C and/or  $\alpha$ 28-D, wherein the polynucleotide sequences are selected from the group consisting essentially of: M76559.1, AF040709.1, AF042792.1, AF042793.1, AB011130.1, T80372.1, AA360556.1, AI563965.1, N53512.1, AA000341.1, CAA90091.1, AI027237.1, AI026646.1, AA994701.1, AA887514.1, AI275868.1, AI675521.1, AA906993.1, AA301068.1, AI884536.1, AI862563.1, AI191453.1, AI241832.1, AA534927.1, AA329137.1, AI586961.1, AA394008.1, AW007700.1, R38827.1, AA255807.1, H11152.1, R60736.1, T16903.1, AA435601.1, AI094263.1, AA008996.1, AI105056.1, AI502878.1, Z84493.1, Z84494.1, Z75743.1, Z75742.1, Z84492.1, AA815447.1, AA190607.1, AI223142.1, AA188635.1, R43629.1, R20288.1,

USSN: 09/787,657

- 7 -

5947-01-AWZ

AA459684.1, AA662058.1, Z44942.1, Z40693.1, AI051759.1, AU022914.1, AI843362.1, G36524.1, AA459804.1, AI696320.1, AI051759.1, AI696214.1, AC010180.1, AA445859.1, AJ010949.1, AA190607.1, AI051759.1, T70594.1, T96901.1, AA766033.1, AI160471.1, AA719773.1, AI003601.1, AA442451.1, AA521470.1, AA770076.1, AA001411.1, AA001473.1, W22650.1, H86016.1, AC005342.1, AC005343.1, T96900.1, AI457823.1, AI377638.1, and AI433691.1, AA001473.1 and any of the polynucleotide sequences of SEQ ID NOS 16, 18-41, or 43-49.

34. (Withdrawn) A method of using polynucleotide sequences to identify the binding potential of the polynucleotide sequences to gabapentin, wherein the polynucleotide sequences are selected from the group consisting essentially of: M76555.1, AF040709.1, AF042792.1, AF042793.1, AB011130.1, T80372.1, AA360556.1, AI563965.1, N53512.1, AA000341.1, CAA90091.1, AI027237.1, AI026646.1, AA904701.1, AA887514.1, AI275868.1, AI675521.1, AA906993.1, AA301068.1, AI384536.1, AI862563.1, AI191453.1, AI241832.1, AA534927.1, AA329137.1, AI586961.1, AA394008.1, AW007700.1, R38827.1, AA255807.1, H11152.1, R60736.1, TI6903.1, AA435601.1, AI094263.1, AA008996.1, AI105056.1, AI502878.1, Z81493.1, Z84494.1, Z75743.1, Z75742.1, Z84492.1, AA815447.1, AA190607.1, AI223142.1, AA188635.1, R43629.1, R20288.1, AA459684.1, AA662058.1, Z44942.1, Z40693.1, AI051759.1, AU022914.1, AI843362.1, G36524.1, AA459804.1, AI696320.1, AI051759.1, AI696214.1, AC010180.1, AA445859.1, AJ010949.1, AA190607.1, AI051759.1, T70594.1, T96901.1, AA766033.1, AI160471.1, AA719773.1, AI003601.1, AA442451.1, AA521470.1, AA770076.1, AA001411.1, AA001473.1, W22650.1, H86016.1, AC005342.1, AC005343.1, T96900.1, AI457823.1, AI377638.1, and AI433691.1, AA001473.1 and any of the polynucleotide sequences of SEQ ID NOS 16, 18-41, or 43-49.

34. (New) An isolated and purified DNA sequence encoding a polypeptide of SEQ ID NO: 5.

35. (New) An isolated and purified DNA sequence, which comprises a polynucleotide sequence encoding a polypeptide of SEQ ID NO: 5.